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## Modeling the causal relationship of intellectual fluency and Sports passion of motivation to learning of handball for students

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### Abstract

The research aims to identify the degree of intellectual fluency, sports passion, and learning motivation in handball for third-stage students, and to identify the correlation between intellectual fluency, sports passion, and learning motivation in handball for third-stage students, and to build a causal relationship model to identify the direct and indirect effects of intellectual fluency. And sports passion for learning motivation in handball for third-stage students.

The descriptive approach was used using survey methods and correlations, and the research community included third-stage students in the College of Physical Education and Sports Sciences - University of Babylon for the academic year (2022-2023), whose number is (212) students, and a sample of building the sports passion scale was chosen by (55) students. The main research sample consisted of (107) students who were chosen randomly by lottery.

The measure of intellectual fluency consisted of (30) items representing four domains, the measure of sports passion (16) items representing two domains, and the learning motivation measure (50) items representing six domains) which represents the external independent variables in (sports passion and learning motivation) as internal dependent variables, and the indirect effects of the fields of (intellectual fluency) in (learning motivation) through (sports passion) as a mediator and internal variable, and the statistical bag (SPSS) and (AMOS) program were used for the purpose of data processing.

The research came out with a set of conclusions, including: the emergence of a strong direct correlation with significant statistical significance between intellectual fluency, sports passion and learning motivation in handball for students, and the validity of the causal model for path analysis was proven in the statement and clarification of the precedence of the variables in terms of being independent, mediating and dependent.

The research came out with a set of recommendations, including: the need to work hard to achieve intellectual fluency for students because of its great role in sports passion and learning motivation to achieve the goals of the educational process and the future goals of students. Or the theory of what has to do with learning motivation.

**Keywords:** Modeling, intellectual fluency, sports passion, motivation to learning

### 1. Introduction

Sports psychology is one of the important topics in developing and improving the performance level of athletes, and it is one of the topics that researchers are interested in in their scientific studies in the sports field, as the sports field is one of the fields that reflect the progress and development of the countries of the world, and various sciences have contributed to this progress and development All of them work to overcome the difficulties facing the educational process and prepare the learner in a comprehensive and balanced preparation in order to reach the higher levels in the chosen sports activity.

Intellectual fluency is one of the skills of creative thinking and one of the manifestations of personality. It helps individuals to find a lot of ideas or solutions to the problems presented. It helps the individual to focus on the situation or problem, realize it and deal with it through the experiences he possesses to find a set of acceptable solutions.

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Sports passion is influential in the life and feelings of the individual, as it is considered a motivating aspect, because people spend a lot of effort and time to reach their goals or practice the activities they love. The preferred sporting activity is accompanied by an unclear sense of pleasure, physiological changes, attraction, excitement and passion because it is linked to the psychological tendency of the individual, because the passion leads the athlete to invest long times in practice to improve his skills and raise the level of his performance.

Learning motivation occupies a distinct importance in the field of learning different motor skills, and this is due to the fact that it is concerned with the causes or drivers of behavior and that every behavior behind it is a specific driving force that is a driving force for the learner in order to achieve excellence in learning the motor skills required of him, as it means the desire to perform well and achieve success. It is a self-goal that activates and directs behavior and is one of the important components of success. In light of this, motivation can be seen as representing striving and striving towards a certain level of excellence and superiority. The performance goal is determined either by competing with a standard or a certain level of excellence, competing with others, or competing. The learner with his previous performance and trying to strive and struggle towards a single performance and persevering in that long-term effort towards being able and controlling the performance of what is difficult.

The importance of delving into students is highlighted by studying the variables (intellectual fluency, sports passion, learning motivation) that play an important role in directing the student's correct behavior, determining their behavior and shaping their future goals, and studying (intellectual fluency) as an independent variable and its direct impact on (sports passion) As a dependent and mediating variable and in (learning motivation) as a dependent variable, and indirectly in (learning motivation) as a dependent variable through (sports passion) which is a mediating variable, using advanced statistical methods that assume the existence of these effects, and among these methods is the path analysis method that gives a model study data and explain the effect of these variables, due to the lack of studies on students in these variables, which have an active and distinctive role in the educational process.

### 1.1 Research problem

Intellectual fluency is one of the broad, comprehensive and useful topics in the educational field, as it helps to produce many alternatives for students and choose the best one through the stages of learning sports skills for different games, including handball, and this helps to form the student's desire, inclinations and love to play handball, and it is related this is due to the immersion and passion in practicing motor skills in order to improve performance, and that the distinguished and creative student enjoys a high level of motivation for skillful performance. From all of the above, the current study will work to answer the following questions:

1. Is there a correlation between intellectual fluency, sports passion, and learning motivation in handball for third-year students?
2. Are there direct effects of intellectual fluency on sports passion and learning motivation in handball for third-year students?
3. Are there direct effects of sports passion on learning motivation in handball for third-stage students?
4. Are there indirect effects of intellectual fluency on

learning motivation in handball for third-stage students?

### 1.2 Research objectives

1. Identify the degree of intellectual fluency, sports passion, and learning motivation in handball for students.
2. Identifying the correlation between intellectual fluency, sports passion, and learning motivation in handball for third-stage students.
3. Building a causal relationship model to identify the direct and indirect effects of intellectual fluency and sports passion on learning motivation in handball for third-stage students.

### 1.3 Research hypothesis

1. There is a direct significant correlation between intellectual fluency, sports passion, and learning motivation in handball for third-stage students.
2. It is possible to build a model for the causal relationship between intellectual fluency and sports passion with learning motivation in handball for third-stage students.
3. There are direct and indirect effects of intellectual fluency and sports passion on learning motivation in handball for third-stage students.

### 1.4 Research fields

**The human field:** Third-stage students in the College of Physical Education and Sports Sciences - University of Babylon for the academic year 2022-2023.

**Time field:** from 20-10-2022 to 7-2-2023.

**Spatial field:** Classrooms in the College of Physical Education and Sports Sciences - University of Babylon.

## 2. Research methodology and field procedures

### 2.1 Research Methodology

The researchers used the descriptive approach using survey methods and correlational relationships due to its suitability to the nature of the study.

### 2.2. Community and sample research

The research community included (212) students of the third stage in the College of Physical Education and Sports Sciences - University of Babylon for the academic year (2022-2023). They were chosen randomly by lottery.

### 2.3 Field Research Procedures

#### 2.3.1 Intellectual Fluency Scale

After reviewing similar studies and research, a measure of intellectual fluency was prepared for the research sample prepared by (Fatima, 2022). A group of experts and specialists in sports psychology, numbering (9), to demonstrate the validity of the amended paragraphs. After processing the data using ( $\chi^2$ ), it was found that all paragraphs are acceptable because its calculated value is higher than its tabular value of (3.84) under a level of significance (0.05) and a degree of freedom (1).

#### 2.3.1.1 The Exploratory Experiment of the Intellectual Fluency Scale

The exploratory experiment of the intellectual fluency scale was conducted on a sample of third-stage students in the College of Physical Education and Sports Sciences - University of Babylon, who numbered (22) students, on Wednesday corresponding to (11/23/2022), and the average

time to answer the scale items was (15). Accurate, and thus the scale is ready to be applied to the research sample.

### 2.3.2 Learning Motivation Scale

In line with the objectives of the research and after reviewing similar studies and research, the researchers prepared a measure of learning motivation for the research sample prepared by (Belkacem Dudu and Belkacem Mo Houbi, 2017). In accordance with the research sample, it was presented to a group of (9) experts and specialists in sports psychology to demonstrate the validity of the modified paragraphs, and after processing the data using (Ki<sup>2</sup>) it was found that all the paragraphs are acceptable because their calculated value is higher than its tabular value of (3.84) under the level of significance (0.05)) and degree of freedom (1).

#### 2.3.2.1 Exploratory experience of learning motivation scale

The exploratory experiment of the learning motivation scale

was conducted on the same sample on which the exploratory experiment of the intellectual fluency scale was conducted on the same day and date, and the average time to answer the paragraphs of the scale was (21) minutes, and thus the scale became ready to be applied to the research sample.

### 2.3.3 Sports Passion Scale

After following up and reviewing some previous research and studies, the construction of the sports passion scale in handball was started for the purpose of identifying it among the students. It is (always, sometimes, never) and the key to correction for the paragraphs of harmonious passion (1,2,3) and for the paragraphs of compulsive passion (1,2,3). The paragraphs were presented to a group of (9) experts and specialists in sports psychology to demonstrate their validity. Data processing using (Ca<sup>2</sup>) shows the acceptability of all paragraphs because its calculated value is higher than its tabular value of (3.84) under a level of significance (0.05) and a degree of freedom (1).

**Table 1:** Domains of sports passion scale and their paragraphs:

N	The field	Paragraphs	Total
1	Harmonious passion	15, 13, 11, 9, 7, 5, 3, 1	8
2	Compulsive passion	16, 14, 12, 10, 8, 6, 4, 2	8
Total			16

#### 2.3.3.1 Exploratory Experiment of Sports Passion Scale

The exploratory experiment of the sports passion scale was conducted on the same sample as the exploratory experiment of the intellectual fluency scale was conducted on the same day and date, and the average time to answer the paragraphs of the scale was (11) minutes, and thus the scale became ready to be applied to the research sample.

#### 2.3.3.2 Application of the sports passion scale on the building sample

The sports passion scale was applied to a sample of (55) third-stage students, on Monday corresponding to (12/12/2022).

#### Statistical analysis of the sports passion scale

Follow two methods in analyzing the paragraphs of the sports passion scale, namely the discriminatory ability (the two end groups) and the coefficient of internal consistency.

##### First: discriminatory ability (the two extreme groups)

To reveal the discriminatory ability of the paragraphs of the sports passion scale for (55) students, as (33%) of the questionnaires with higher and lower degrees were assigned, as the number of questionnaires for each group reached (18) questionnaires, and (33%) were excluded. The middle one, which has (19) forms. The discrimination coefficient for each paragraph of the scale was calculated using the t-test for two independent samples using the statistical bag for social sciences (spss). And it was found that the value of the level of significance for all paragraphs is less (0.05) at a degree of freedom (34), and thus all paragraphs are significant.

##### Second: internal consistency coefficient

#### 1) The correlation between the paragraph score and the total score of the sports passion scale

The simple correlation coefficient (Pearson) was used in order to verify the significant significance of the correlation coefficient between the scores of the sample members on each paragraph and their total scores on the sports passion scale) at a degree of freedom (54), and thus the number of significant items is (17).

#### 2) The correlation of the paragraph score with the total dimension score of the sports passion scale

This method is based on finding the simple correlation coefficient between the degree of the paragraph and the total degree of the field to which it belongs, and make sure of the significance of the correlation.

#### 2.3.4 The main experience

The main purpose of the main experiment is to apply the paragraphs of the standards on the main application sample, and they were applied to a sample of third-stage students, which numbered (107) students, on Thursday corresponding to 13/1/2023.

#### 2.3.5 Psychometric properties of scales

**First - the validity of the scale:** This type of validity was achieved when the paragraphs of the scales were presented to a group of experts in the field of sports psychology, so that each of them expresses his opinion on the validity of the paragraph.

**Second - the Reliability of the scale:** In order to verify the reliability of the scales, the researchers used two types of reliability, namely:

**1) The split-half method:** For the purpose of verifying this method on the main sample of (107) students, the items of the scales were divided into odd and even paragraphs, and then the coefficient of reliability of half of the scale was calculated between the scores of the individuals on the two parts of the scale using the correlation coefficient (Pearson), and then it was subjected Correlation coefficient of correction using the (Spearman-Brown) equation, so the reliability coefficient appeared high for all measures.

**2) The Alpha Cronbach method:** The researchers conducted the Alpha Cronbach equation on the main sample of (107) students, and all the values of the scales with a high reliability coefficient appeared, and Table (2) shows these values.

**Table 2:** Reliability coefficient using the Cronbach split half method

Scales	Split-half		Alpha Cronbach
	Correlation coefficient (Pearson)	coefficient (Spearman - Brown)	
Intellectual fluency	0.786	0.880	0.757
Sports passion	0.822	0.902	0.817
Learning motivation	0.813	0.897	0.794

**2.4 Statistical Methods**

The statistical bag (SPSS) version (24) was used for statistical methods for the purpose of processing the statistical results (arithmetic mean, standard deviation, correlation coefficient (Spearman - Brown), good fit test (Ca2), simple correlation coefficient (Pearson), Vakronbach equation, t-test (t-test), and the program (AMOS) version (24) was used to extract the

results of the direct and indirect effect of the variables.

**3. Presentation, analysis and discussion of the results**

**3.1 Presentation and analysis of the results of measures of intellectual fluency, Sports passion and learning motivation**

**Table 3:** The statistical parameters of intellectual fluency, Sports passion and learning motivation:

Scales	Mean	Hypothetical Mean	Std. Deviation	Value (t) calculated	Sig level
Intellectual fluency	70.411	60	8.776	12.271	0.000
Sports passion	35.832	32	3.113	12.734	0.000
Learning motivation	124.766	100	6.316	40.558	0.000

Table (3) shows the results of the measures of intellectual fluency, sports passion and learning motivation for students. In the measure of intellectual fluency, the arithmetic mean was (70.411) and the standard deviation was (8.776). After comparing the arithmetic mean with the hypothetical mean, it was found that it is higher than the hypothetical mean. The t-test for one sample, the calculated t-value showed a value of (12.271), which is statistically significant at a level of significance (0.05) and a degree of freedom (106), and the researchers believe that the creative student of physical education is characterized by a high level of intellectual fluency, as this enables him to present many ideas in situations Skill performance or solve a problem in any part of learning skills or suggest a set of ideas to try to reach the best learning stage in sports skills, this is confirmed by (Hassan Ahmed Issa 2003) that "the role of intellectual fluency in the stages of generating ideas among students of physical education through the stages of the process of learning sports skills for different sports enables him to produce a large number of alternatives that are compared to choose the best creative motor solutions." (Hassan Ahmed Issa: 2003, 101) In the sports passion scale, the arithmetic mean was (35.832) and the standard deviation was (3.113), and after comparing the arithmetic mean with the hypothetical mean, it was found that it is higher than the hypothetical mean. To test the significance of these differences statistically, the t-test was used for one sample. The calculated t-value appeared with a value of (12.734), which is statistically significant at a significance level of (0.05) and a degree of freedom (106). This shows that sports passion represents an important factor for considering the practice of a beloved sporting activity in which it is fun and meaningful and aims to positively

influence the life of the student. (Safaa et al., 2020) believes that the passion is positively related to the feeling of psychological well-being and life satisfaction among those who practice sports activities and to prevent the occurrence of experiences that affect It has a negative effect on the athlete's psyche, and predicts the athlete's emotional and emotional state in their future lives, according to their success and failure in sports competitions. (Safaa et al., 2020, 247) In the measure of learning motivation, the arithmetic mean was (124.766) and the standard deviation was (6.316), and after comparing the arithmetic mean with the hypothetical mean, it turned out to be higher than the hypothetical mean. To test the significance of these differences statistically, the t-test was used for one sample. The calculated t-value appeared with a value of (40.558), which is statistically significant at a significance level of (0.05) and a degree of freedom (106). The researchers see that students accept skillful performance effectively, which is one of the basic conditions for learning, and students can reach their goals and not give up or retreat and are ready to reach good learning and who make a great effort to overcome the difficulties and obstacles facing them, and this is confirmed by (Qatami and Adass 2002) motivation for learning is a distinct case of general motivation and refers to an internal state of the learner that pushes him to pay attention to the educational situation and turn to it with directed activity and continue with it until learning is achieved. (Qatami and Adass: 2002, 15)

**3.2 Presentation, analysis and discussion of the results of the association between intellectual fluency, sports passion and learning motivation**

**Table 4:** Correlation coefficient between intellectual fluency, sports passion, and learning motivation:

Scales	Correlation coefficient	Sig level	Sig type
Intellectual fluency + sports passion	0.745	0.000	Sig
Intellectual fluency + learning motivation	0.905	0.000	Sig
Sports passion + learning motivation	0.742	0.000	Sig

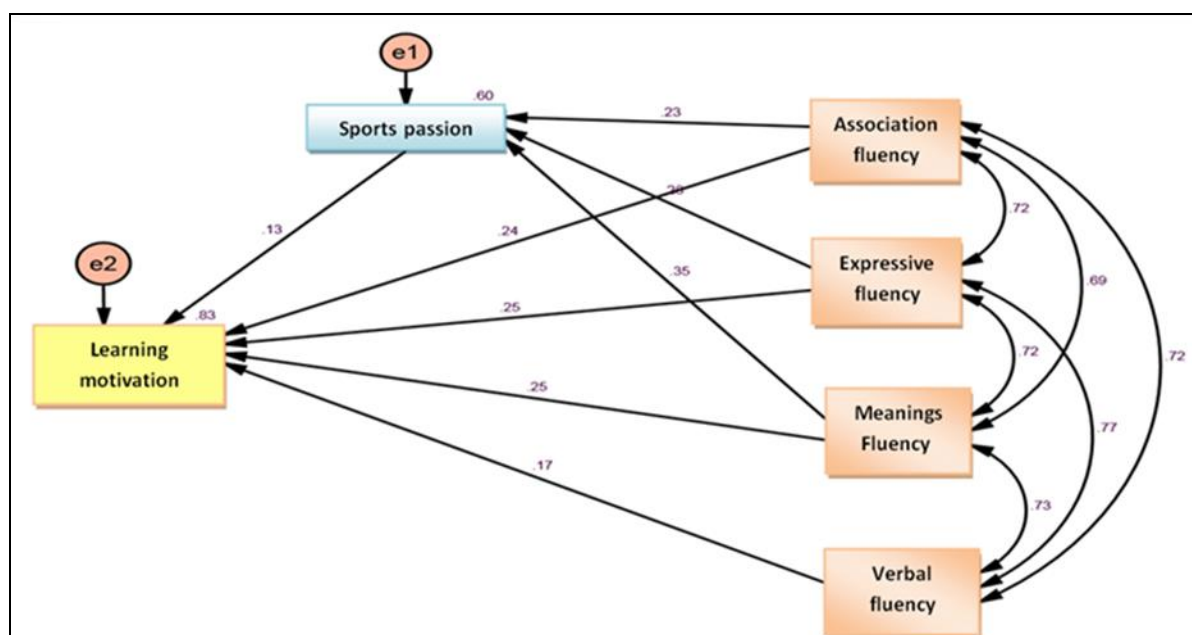
Table (4) indicates a significant correlation between intellectual fluency, sports passion and learning motivation, and this indicates a strong positive relationship between them, that is, the greater the intellectual fluency, the greater the sports passion and learning motivation.

The researchers believe that the enjoyment of physical education students with intellectual fluency, sports passion, and learning motivation helps them complete their educational tasks well. In addition, students who are characterized by these variables are characterized by commitment to university regulations and laws, and carry out what is required of them of educational duties, which makes them industrious, scientifically superior, and loving their lessons. It leads to obtaining relatively high grades in practical subjects, including handball, as the student achieves the compatibility between him and his academic environment in the game of handball, in which the student seeks to achieve the best grades and spend the most time in it to gain experience, learn skills, and improve the level of skillful performance, and he believes (Safaa *et al.*, 2020) that sports

passion is a strong desire towards a specific activity that he prefers People love it and find it important, and they occupy their efforts, energy and time in it on a regular basis (Safaa *et al.*, 246, 2020), this confirms that students are trying to achieve themselves, especially at this age, as well as the university climate and environment, the requirements of study and the accompanying requirements of life that lead him to have the intellectual, skillful and scientific ability. When he is born with this concept, he is accompanied by a high sense of self-esteem as well as the methods of upbringing Cognitive and social studies used by most universities, which encourage the creation of students with a good level of intellectual fluency.

**3.3 Model relationships between variables**

In order to extract the path coefficients for the research variables, they must be processed statistically in the SPSS and AMOS programs, as the values reached the path coefficients according to the model in Figure (1).



**Fig 1:** Standard model indicators of direct and indirect causal relationships

From the diagram, the following details can be shown

- 1. Independent variables:** represented by the variable of intellectual fluency: and its fields are all of the following:
  - Fluency of association.
  - Expressive fluency.
  - Fluency of meanings.
  - Verbal fluency.
- 2. Intermediate variables:** Represented by the sports passion variable.
- 3. Dependent variables:** represented by learning motivation variable.

**3.3.1 The direct, indirect and overall effects of the theoretical model**

It is clear from the theoretical study model that there is an interaction between the independent variables, the mediating variable, and the dependent variable by showing direct and indirect effects, and from that it becomes clear that there are

independent variables and a mediating variable that have an effect on the dependent variable (learning motivation), and (Abdul Aziz 2013) identifies the differences between The dependent, independent and mediating variables are as follows: "The independent variable is called, it is the variable that affects and is not affected by the dependent variable, while the dependent variable is the one that is influenced by the independent variable or variables, and the intermediate variable is the one that may have a role in influencing the dependent variable, and if it were not for its existence, the independent variable would not be able to change the dependent variable. Therefore, the path analysis was adopted to show the various direct and indirect effects on the variables of the study, and this analysis allows the possibility of identifying the independent variables, the intermediate variable, and the dependent variable, and Table (5) shows that.

**Table 5:** Direct, indirect and total effects of the independent variables on the dependent variables:

Effect type	The independent and mediating variables	Dependent variables	
		Sports passion	Learning motivation

Direct influences	Association fluency	0.227	0.240
	Expressive fluency	0.282	0.252
	Meanings Fluency	0.349	0.253
	Verbal fluency	0	0.168
	Sports passion	0	0.126
Indirect influences	Association fluency	0	0.029
	Expressive fluency	0	0.036
	Meanings Fluency	0	0.044
Total effects	Association fluency	0.227	0.269
	Expressive fluency	0.282	0.288
	Meanings Fluency	0.349	0.297
	Verbal fluency	0	0.168
	Sports passion	0	0.126

Table (5) shows the direct, indirect, and total normative effects of the independent variables on the dependent variables, as it turns out that the field of (fluency of meanings) has the greatest impact on (intellectual fluency) in (Sports passion), as its total effect was (0.349), and the direct effect was (0.349)) and there is no indirect effect, and also the most influential fields appeared in (learning motivation), as the total effect was (0.297), the direct effect (0.253), and the

indirect effect (0.044).

### 3.3.2 Indicators of good conformity to the theoretical model

There are main indicators to know the quality of conformity of the proposed theoretical model for the study, they were used, which give the proposed model a high possibility of conformity, and Table (6) shows that.

**Table 6:** The quality of the proposed path analysis model for the study:

Chi <sup>2</sup>	D. F.	X <sup>2</sup> / df	Sig	GFI	AGFI	CFI	RMSEA
1.491	1	1.491	0.222	.9950	.9030	0.999	0.068

### Through the values in table (6) for good conformity to the theoretical model, the following is shown

**Chi-square:** The value of (Chi<sup>2</sup>) is one of the most important indicators of conformity to the model, as its value was (1.491) and with a degree of freedom (1). And it is good for accepting the model, as (Abdul Hamid 2009) indicates that “the degree of acceptance in path analysis is by dividing the result of (Chi<sup>2</sup>) by the degree of freedom. If it is less than (5) it indicates the acceptance of the model, and if it is less than (2) it indicates that The model is completely identical to the data”. (Abdul Hamid: 7, 2009)

**(GFI):** In order to ensure the quality of match, it was necessary to use other statistical indicators that support the quality of the model, including the Good Match Index (GFI), and (Saeed 2018) explains it: “It is similar to the square of the multiple correlation coefficient in multiple regression analysis It measures the amount of variation that the proposed model can explain, and the ideal value for the indicator is (0.90) (Saeed 2018, 32), and the value of the GFI index is (0.995), which is acceptable.

**(AGFI):** The same applies to the value of the (AGFI) index, as its value amounted to (0.903), as it is considered an acceptable value because the closer it is to (1), the greater the dependence on it, as it is reported (Fahd 2012) "This has been developed The index is to correct the good matching index from the complexity of the model, and the matching of the model is confined between (0, 1) and the high score (0.90) and above indicates the matching of the model and can be used to compare different models for the same data or one

model for different samples. (Fahd: 2012, 33)

**(CFI):** One of the comparison-based indicators on which the (CFI) index is also based. It is based on comparing the supposed (Ca2) with the value (Ca2) of the independent model. The value of this indicator ranges between (0-1) and the high value indicates between This extent indicates a better conformity of the model with the data of the sample (Amjad: 119, 2012), and the value of the comparative conformity index was ((0.999), which is a greater value than the value indicating good conformity.

**(Rmse) Index:** One of the most important indicators on which the proper construction of the path analysis model is based is the (RMSEA) index, which is the approximate Root Mean Square Error and the Root Mean Squares Standard Residual Index, and the (RMSEA) index that measures divergence By means of degrees of freedom between the population data and the hypothetical model, as its value amounted to (0.068), and (Abdul Hamid 2009) indicates, “If the value of the (RMSEA) indicator is equal to (0.05) or less, this indicates that the model completely matches the data. The sample data is large, but if its value exceeds (0.08), then that model is rejected.” (Abdul Hamid: 8, 2009)

### 3.3.4 Presentation, analysis and discussion of the results of the regression weights

The standard and non-normative regression weights coefficients were extracted for each of the independent and dependent variables, through Figure (1), and Table (7) shows the values of the regression weights.

**Table 7:** The values of the weights of the regressions of the independent variables on the dependent variables:

Independent variables	Impact direction	Dependent variables	Regression weights		Standard error	Critical ratio	Sig level	Sig type
			Standard	Non Standard				
Association fluency	→	Sports passion	0.227	0.315	0.133	2.371	0.018	Sig
		Learning motivation	0.240	0.678	0.184	3.677	0.000	Sig
Expressive fluency	→	Sports passion	0.282	0.382	0.135	2.834	0.005	Sig
		Learning motivation	0.252	0.692	0.198	3.500	0.000	Sig
Meanings Fluency	→	Sports passion	0.349	0.440	0.120	3.660	0.000	Sig
		Learning motivation	0.253	0.647	0.175	3.705	0.000	Sig
Verbal fluency	→	Learning motivation	0.168	0.375	0.158	2.376	0.018	Sig
Sports passion	→	Learning motivation	0.126	0.256	0.127	2.016	0.044	Sig

Table (7) shows the direct and significant effects of the variables. Direct effects mean the effect of one variable on another variable directly, and it is represented in the model used by (←), meaning that the first variable affects the second variable and is determined in a specific direction that expresses the path coefficient. In the aforementioned table, we notice a direct relationship between the variable And another, the more the amount of one of them increased, the effect of increasing the other was significant (0.05).

The most important thing that Table (7) shows is the regression weights, which are a good expression of the relationship between the variables, or in other words, what effect each variable leaves on another variable, which is an expression of the common variance and thus expresses the direct relationship, meaning that the increase in one of them is the increase in the variable partner, and this is evident in all

relationships, as the standard regression weights coefficients were extracted for each of the independent and dependent variables, it turned out that the high value of the weight indicates the size of the effect of the variable in a partner who is to indicate which of the effect sizes was higher. Use the method of standard weights with which it is possible to compare the effect sizes and according to what is indicated in the table above, as it appears that the highest effect size was to clarify the direct relationship between Each variable is independent and dependent through the arrow emerging from each variable to a second variable, then to a third variable, and then the relationship between the first and the third variable will be an indirect relationship.

**3.3.5 Presentation of the values of the correlation coefficient between the independent variables:**

**Table 8:** The values of the correlation coefficient between the independent variables:

Independent variables	Impact direction	Dependent variables	Regression weights		Standard error	Critical ratio	Sig level	Sig type
			Standard	Non Standard				
Association fluency	↔	Expressive fluency	0.722	3.679	0.610	6.027	0.000	Sig
		Meanings Fluency	0.692	3.787	0.646	5.859	0.000	Sig
		Verbal fluency	0.719	4.505	0.750	6.010	0.000	Sig
Expressive fluency	↔	Meanings Fluency	0.721	4.055	0.674	6.019	0.000	Sig
		Verbal fluency	0.770	4.961	0.790	6.281	0.000	Sig
Meanings Fluency	↔	Verbal fluency	0.734	5.082	0.834	6.094	0.000	Sig

Table (8) shows that all the correlations between the independent variables are with a high correlation coefficient and a level of significance less than (0.05), which is a clear result because intellectual fluency is one of the creative thinking skills, which has the ability to quickly and easily deduce a large number of creative ideas or solutions to the problems posed. Which distinguishes the ability of the learner compared to his colleagues, and among these ideas is verbal fluency, which has the ability to generate the largest number of words in a specific time and learn motor skills that require verbal attitudes, in addition to the fluency of association, which also has the ability to produce the largest possible number of utterances that meet certain conditions in terms of meaning, and the time is sometimes determined in them, and similar educational ideas are derived when learning any motor skill, and the fluency of meanings, which also has the ability to quickly provide the largest possible number of Ideas depending on certain conditions and at a specific time and the ability to form new and varied ideas during the learning process, and expressive fluency, which also has the ability of the student to formulate ideas in useful phrases and think quickly in sequential words that are appropriate to the situations in the learning process and the ability to learn more than one skill within a period of time short .

**4. Conclusions and Recommendations**

**4.1 Conclusions**

1. The results showed significant differences in the measures of intellectual fluency, sports passion, and learning motivation in handball for students, in favor of the achieved mean.
2. The emergence of a strong, direct, statistically significant correlation between intellectual fluency, sports passion, and learning motivation in handball for students.
3. The causal model for trajectory analysis has been proven correct in stating and clarifying the precedence of the variables in terms of being independent, intermediate and dependent.
4. The emergence of direct effects of the independent variables fields of intellectual fluency (fluency of association, expressive fluency, fluency of meanings) with the mediating variable (sports passion) in handball for students.
5. The emergence of direct effects of the independent variables in the areas of intellectual fluency (associative fluency, expressive fluency, meanings fluency, verbal fluency) on the dependent variable (learning motivation) in handball for students.
6. The emergence of indirect effects of the independent variables fields of intellectual fluency (fluency of

association, fluency of expression, fluency of meanings) on the dependent variable (learning motivation) through the intermediate variable (sports passion) in handball for students.

7. The emergence of a strong direct correlation between the domains of students' intellectual fluency scale.

#### 4.2 Recommendations

1. Benefiting from the current research standards by researchers and specialists to measure the variables for which they were prepared.
2. The need to work hard to achieve intellectual fluency for students, which plays a major role in sports passion and learning motivation to achieve the goals of the educational process and the future goals of students.
3. Teachers should work to achieve the students' Sports passion and make it at a good level during practical or theoretical lectures, as it is related to learning motivation.
4. Interest in developing sports passion through extension programs.
5. Conducting studies related to intellectual fluency, sports passion, learning motivation for other sports, and a number of psychological variables for students and players.

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